

What is claimed is:

1. A substrate processing apparatus that a processing liquid is supplied to one major surface of a substrate and one major surface is subjected to predetermined substrate processing, comprising:

an atmosphere blocking member which is faced with other major surface of said substrate and that is away from said substrate; and

a gas supplying unit which supplies a atmosphere gas to a space which is created between said atmosphere blocking member and said substrate,

wherein a substrate-facing surface of said atmosphere blocking member which is faced with the other major surface of said substrate becomes closer to said substrate with a distance toward a periphery edge of said atmosphere blocking member.

2. The substrate processing apparatus of claim 1, further comprising rotation means which rotates said substrate to which said processing liquid is supplied.

3. The substrate processing apparatus of claim 2, wherein said rotation means rotates said atmosphere blocking member together with said substrate.

4. The substrate processing apparatus of claims 1, further

comprising at least three or more support members which are disposed at the periphery edge of said atmosphere blocking member, abut on an edge surface of said substrate and accordingly support said substrate.

5. The substrate processing apparatus of claim 4, wherein each one of said support members comprises a contact surface which comes into a line contact with the edge surface of said substrate and supports said substrate.

6. The substrate processing apparatus of claim 5, wherein a width of said contact surface is approximately the same as a width of a portion of said line contact.

7. The substrate processing apparatus of claim 5, wherein a width of each one of said support members along a direction of said line contact becomes narrower with a distance away from said substrate or remains the same.

8. The substrate processing apparatus of claims 1, wherein a central area of said substrate-facing surface which is faced with an approximately central portion of said substrate is a flat surface, and a periphery edge area of said substrate-facing surface which is faced with a periphery edge of said substrate is an angled surface which becomes closer to said substrate with a distance toward a periphery edge of said substrate-

facing surface.

9. The substrate processing apparatus of claims 1, wherein said atmosphere blocking member has a diameter which is the same as or smaller than a diameter of said substrate.

10. A substrate processing system, comprising: a processing unit whose structure is the same as that of the substrate processing apparatus of claims 1; and

a transportation unit which transports substrates to said processing unit.

11. The substrate processing system of claim 10, further comprising a reversing unit which reverses substrates.

12. A substrate processing apparatus that a processing liquid is supplied to one major surface of a substrate which comprises a substrate nick portion at a periphery edge of said substrate and which is approximately shaped as a disk, and one major surface is subjected to predetermined substrate processing, comprising:

substrate supporting means which supports said substrate; and

an atmosphere blocking member which is disposed in the vicinity of said substrate and faced with other major surface of said substrate which is supported by said substrate supporting means, wherein

said atmosphere blocking member is formed by a member whose outer shape is a circle having a diameter which is the same or smaller than that of said substrate, and a blocking member nick portion is formed at a periphery edge of said member such that said blocking member nick portion corresponds to said substrate nick portion.

13. The substrate processing apparatus of claim 12, further comprising rotation means which rotates said atmosphere blocking member together with said substrate to which said processing liquid is supplied, in a condition that said substrate nick portion is faced with said blocking member nick portion.

14. The substrate processing apparatus of claims 12, wherein said substrate nick portion is a notch or an orientation flat.

15. A substrate processing system, comprising a processing unit whose structure is the same as that of the substrate processing apparatus of claims 12; and

a transportation unit which transports substrates to said processing unit.

16. The substrate processing system of claim 15, further comprising a reversing unit which reverses substrates.

17. A substrate processing apparatus that a processing liquid is supplied to one major surface of a substrate which comprises a substrate nick portion at a periphery edge of said substrate and which is approximately shaped as a disk, and one major surface is subjected to predetermined substrate processing, comprising:

substrate supporting means which supports said substrate; and

an atmosphere blocking member which is disposed in the vicinity of said substrate and faced with other major surface of said substrate which is supported by said substrate supporting means, wherein

an outer shape of said atmosphere blocking member is a circle whose radius is defined as: (the radius)  $\leq$  (a distance from the center of said substrate to said substrate nick portion); and

said atmosphere blocking member is disposed such that a central axis of said atmosphere blocking member coincides with a central axis of said substrate.

18. The substrate processing apparatus of claim 17, further comprising rotation means which rotates said substrate to which said processing liquid is supplied.

19. The substrate processing apparatus of claim 16, wherein said rotation means rotates said atmosphere blocking member together with said substrate.

20. The substrate processing apparatus of claims 17, wherein said substrate nick portion is a notch or an orientation flat.

21. A substrate processing system, comprising a processing unit whose structure is the same as that of the substrate processing apparatus of claims 17; and

a transportation unit which transports substrates to said processing unit.

22. The substrate processing system of claim 21, further comprising a reversing unit which reverses substrates.

23. A substrate processing apparatus that a processing liquid is supplied to one major surface of a substrate which is obtained by forming a substrate nick portion at a periphery edge of a plate-like member having a predetermined shape, and one major surface is subjected to predetermined substrate processing, comprising:

substrate supporting means which supports said substrate; and

an atmosphere blocking member which is disposed in the vicinity of said substrate and faced with other major surface of said substrate which is supported by said substrate supporting means, wherein

an outer shape of said atmosphere blocking member is approximately a similar figure which is the same as or smaller than said plate-like member, and a blocking member nick portion is formed at a

periphery edge of said member such that said blocking member nick portion corresponds to said substrate nick portion.

24. A substrate processing system, comprising a processing unit whose structure is the same as that of the substrate processing apparatus of claims 23; and

a transportation unit which transports substrates to said processing unit.

25. The substrate processing system of claim 24, further comprising a reversing unit which reverses substrates.

26. A substrate processing apparatus that a processing liquid is supplied to one major surface of a substrate which is obtained by forming a nick portion at a periphery edge of a plate-like member having a predetermined shape, and one major surface is subjected to predetermined substrate processing, comprising:

substrate supporting means which supports said substrate; and

an atmosphere blocking member which is disposed in the vicinity of said substrate and faced with other major surface of said substrate which is supported by said substrate supporting means, wherein

an outer shape of said atmosphere blocking member is approximately a similar figure to said plate-like member whose rate of similarity is expressed as:

(the rate of similarity)  $\leq W_{sb} / (W_{sb} + W_{nt})$

where  $W_{sb}$  ... a distance from the center of said substrate to said nick portion and

$W_{nt}$  ... a notching depth of said nick portion in a notching direction which is from the center of said substrate toward said nick portion; and

said atmosphere blocking member is disposed such that a central axis of said atmosphere blocking member coincides with a central axis of said substrate.

27. A substrate processing system, comprising a processing unit whose structure is the same as that of the substrate processing apparatus of claims 26; and

a transportation unit which transports substrates to said processing unit.

28. The substrate processing system of claim 27, further comprising a reversing unit which reverses substrates.

29. A substrate processing apparatus that a processing liquid is supplied to one major surface of a substrate and one major surface is subjected to predetermined substrate processing, comprising:

substrate supporting means which supports said substrate;

an atmosphere blocking member which is disposed in the vicinity of said substrate and faced with other major surface of said substrate which



is supported by said substrate supporting means; and

a gas supplying unit which supplies a atmosphere gas to a space which is created between said atmosphere blocking member and said substrate, wherein

a gap between a periphery edge of said atmosphere blocking member and the other major surface of said substrate which is supported by said substrate supporting means is 0.3 mm through 1 mm.

30. The substrate processing apparatus of claim 29, wherein said substrate supporting means supports said substrate such that the gap between the periphery edge of said atmosphere blocking member and the other major surface of said substrate is 0.3 mm through 0.8 mm.

31. The substrate processing apparatus of claim 29, further comprising rotation means which rotates said substrate to which said processing liquid is supplied.

32. The substrate processing apparatus of claim 31, wherein said rotation means rotates said atmosphere blocking member together with said substrate.

33. The substrate processing apparatus of claims 29, further comprising at least three or more support members which are disposed at the periphery edge of said atmosphere blocking member, abut on an edge

surface of said substrate and accordingly support said substrate.

34. The substrate processing apparatus of claim 33, wherein each one of said support members comprises a contact surface which comes into a line contact with the edge surface of said substrate and supports said substrate.

35. The substrate processing apparatus of claim 34, wherein a width of each one of said support members along a direction of said line contact becomes narrower with a distance away from said substrate or remains the same.

36. The substrate processing apparatus of claim 33, wherein a width of said contact surface is approximately the same as a width of a portion of said line contact.

37. The substrate processing apparatus of claim 36, wherein a width of each one of said support members along a direction of said line contact becomes narrower with a distance away from said substrate or remains the same.

38. A substrate processing system, comprising a processing unit whose structure is the same as that of the substrate processing apparatus of claims 29; and

a transportation unit which transports substrates to said processing unit.

39. The substrate processing system of claim 38, further comprising a reversing unit which reverses substrates.

40. A substrate processing apparatus that a processing liquid is supplied to one major surface of a substrate which is positioned at a predetermined substrate processing position and supported approximately horizontally, and one major surface is subjected to predetermined substrate processing, comprising:

a substrate moving member whose front edge is finished so as to fit with a periphery edge of a substrate, said substrate moving member being capable of freely moving in the vertical direction following the periphery edge of said substrate at said substrate processing position; and

a vertical drive mechanism which drives said substrate moving member in the vertical direction so that the front edge of said substrate moving member is moved to and positioned at a substrate transfer position, which is above said substrate processing position, and said substrate processing position, wherein

when said substrate is received by the front edge of said substrate moving member which is positioned at said substrate transfer position, said substrate is moved to and positioned at said substrate processing position while maintaining the front edge of said substrate moving member

engaged with said substrate.

41. The substrate processing apparatus of claim 40, further comprising substrate supporting means which supports said substrate approximately horizontally at said substrate processing position, wherein

said vertical drive mechanism, when receiving said substrate at said substrate transfer position, moves to said substrate processing position while maintaining the front edge of said substrate moving member engaged with said substrate, accordingly positions said substrate on said supporting means at said substrate processing position, and moves the front edge of said substrate moving member to a retracted position which is below said substrate processing position.

42. The substrate processing apparatus of claim 41, further comprising separating means which separates a processing space, which is for executing said substrate processing with said processing liquid supplied to one major surface of said substrate which is supported by said substrate supporting means, from a mechanism space in which said substrate moving member and said vertical drive mechanism which have moved to said retracted position are located, wherein

said substrate processing is executed in a condition that the front edge of said substrate moving member is positioned at said retracted position.

43. The substrate processing apparatus of claim 42, wherein said separating means comprises a cup portion which is disposed so as to surround said substrate positioned at said substrate processing position and which includes, in a local area of said cup portion, a through hole for said substrate moving member to vertically move through, and a shutter which opens and closes said through hole; and

after the front edge of said substrate moving member passed through said through hole toward said retracted position, said shutter is closed and said processing space and said mechanism space are accordingly separated from each other.

44. The substrate processing apparatus of claim 40, wherein while maintaining the front edge of said substrate moving member engaged with said substrate, said substrate processing is executed in a condition that the front edge of said substrate moving member is positioned at said substrate processing position.

45. A substrate processing system, comprising a processing unit whose structure is the same as that of the substrate processing apparatus of claims 40; and

a transportation unit which transports substrates to said processing unit.

46. The substrate processing system of claim 45, further

comprising a reversing unit which reverses substrates.